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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,639	04/16/2001	Kenichiro Sato	Q63941	3676

7590

04/30/2003

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EXAMINER

THORNTON, YVETTE C

ART UNIT

PAPER NUMBER

1752

DATE MAILED: 04/30/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-7

Office Action Summary

Application No.

09/834,639

Applicant(s)

SATO ET AL.

Examiner

Yvette C. Thornton

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-6,13-15 and 19-22 is/are pending in the application.
- 4a) Of the above claim(s) 1-3,7-12 and 16-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-6,13-15 and 19-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

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DETAILED ACTION

Election/Restrictions

1. Claims 1-3, 7-12 and 16-18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected inventions, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 6.

Response to Amendment

2. Claims 19-22 are newly added. Claims 1-22 are currently pending. Claims 1-3, 7-12 and 16-18 are withdrawn from consideration.

3. The examiner does not view claims 19-22 as requiring the choice of a specific compound of formula (I-1) to (I-4). For example, when formula (I-1) is chosen in instant claim 1, the limitations of claims 20-22 are met. The following rejections are based on such an interpretation.

Oath/Declaration

4. The examiner acknowledges the declaration submitted pursuant to 37 CFR 1.132 by inventor Kenichiro Sato on February 19, 2003.

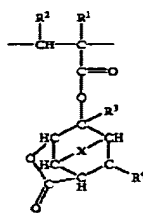
Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

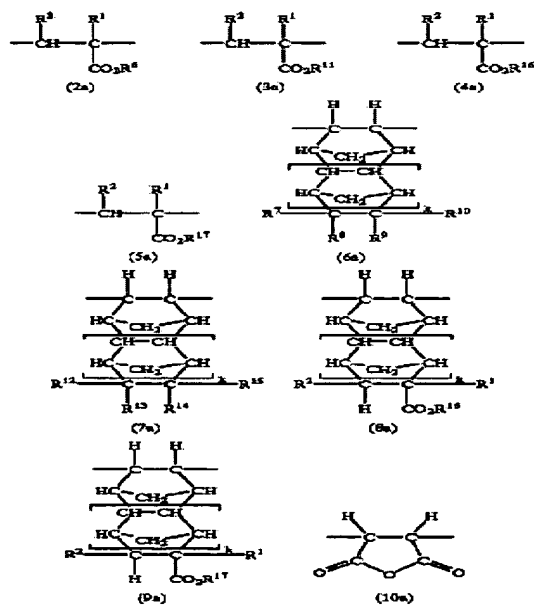
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6. Claims 4-6, 13-15 and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al. (US 6280898 B1). Hasegawa teaches a lactone containing polymer, which is used as a base resin to formulate a resist composition having high sensitivity, resolution and etching resistance. The second aspect of the taught invention provides for a polymer comprising units of general formula (1a) and having a weight average



molecular weight of 1,000 to 500,000 (1a) wherein R1 is a hydrogen, methyl or CH₂CO₂R₅; R2 is hydrogen, methyl or CO₂R₅; R3 is a straight, branched or cyclic alkyl group having 1-8 carbon atoms; R4 is hydrogen or CO₂R₅; R5 is a straight, branched or cyclic alkyl group having 1-15 carbon atoms; X is CH₂, CH₂CH₂, O or S (c. 2, l. 17-65).

The polymer may further include units of at least one of general formulae (2a) to (10a).



(c. 2, l. 66-c. 4, l. 10). In preparing the polymer of

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the invention, the proportions of the respective monomers are properly adjusted so as to produce a polymer, which will exert the desired performance when formulated as a resist composition. If desired the polymer can be prepared by copolymerizing (i) the first monomer of formula (1) with (ii) at least one second monomer of formula (2a) to (10a) and further with (iii) a third monomer having a carbon-to-carbon double bond. Examples include methyl methacrylate, maleic acid, norbornene and itaconic anhydride (c. 14, l. 40-60). Preferably the monomer contains 1-70 mol% of formula (1); 1-95 mol% of at least one of formula (2) to (10) and 0-70 mol% of the third monomer. The polymers of the invention have a weight average molecular weight of about 1,000 to 500,000 (c. 14, l. 61-c. 15, l. 12). It is the examiner's position that general formula (1) meets the limitations of a group having claimed formula (I-1) to (I-4); taught formula 10 meets the limitation of claimed formula (NIII) of instant claims 5; and formula (2-5) meet the limitation of claimed formula (NII). Furthermore, when the taught third monomer is norbornene the limitations of claimed formula (I) are met.

The taught resist composition comprises the said polymer as the base resin, an acid generator and a solvent (c. 15, l. 42-49). A basic compound may be blended into the taught composition to suppress the rate of diffusion of the acid generated by the photoacid generator within the resist film (c. 26, l. 56-c. 27, l. 8). The basic compound is formulated in an amount of about 0.001 to 10 parts per part of the photoacid generator (c. 29, l. 41-45). The resist composition may also include, as an optional ingredient, a surfactant, which is commonly used for improving the coating characteristics. Examples include FLORADE FC-

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430 and FC-431, SURFLON S-141, and MEGAFACE F-8151, which are fluorine-type and silicon-type surfactants (c. 35, l. 1-18).

Hasegawa fails to exemplify a polymer of the instant claims however, one of ordinary skill in the art would have been motivated by the teachings of the prior art to form a polymer comprising a polymer having a unit of general formula (1a), a unit of any of the taught formula (2a) to (10a) and a norbornene unit (i.e., third monomer). Specifically when the polymer has units of formula 1a, (2a), (3a) or (4a), and 10a in combination with a norbornene unit, the limitations of the instant claims are met. One of ordinary skill would have been further motivated by Hasegawa to admix the said polymer with (B) a photoacid generator (C) a basic compound and (D) a surfactant in order to formulate a resist composition having a high sensitivity, resolution and etching resistance.

Response to Arguments

7. Applicant's arguments filed February 19, 2003 have been fully considered but they are not persuasive. Applicants argue that the prior reference to Hasegawa et al. fails to render obvious the claimed invention. Applicants submit declaration evidence in an attempt to show unexpected improvements over the prior art. The examiner has fully considered the said declaration evidence and found it to be unconvincing. The declaration compares inventive resins 1-3 and 9 to polymer 35 of the prior art. The examiner is unclear as to the structures of resins 1-3 and 9. The present specification discloses several different compounds referred to 1-3 (see pg. 58, 62 and 66). The examples further refer to resins (1-1)-(1-12) (pg. 103, 106), resins (2-1)-(2-9) (pg. 111, 115-116, 119), and resins (3-2)-(3-9) (pg. 122). It is unclear to the examiner which resin is being compared to the prior art.

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8. Furthermore, it is unclear as to why the applicant chose polymer 35 as the comparison polymer. The examiner believes a better comparison would have been with polymer 34 of Hasegawa (c. 51). The lactone substituent of the polymer 34 is within the scope of the claimed invention wherein the lactone substituent of polymer 35 is not. Polymer 34 reduces the number of differences between the prior art compound and the claimed compound to 1 (the COOH group of the norbornene monomer) instead of 2 (the COOH group and the lactone substituent) as with polymer 35.

9. For the said reasons, the examiner was unable to make a direct comparison between the cited prior art and the claimed invention. Therefore the rejection of record is maintained.

10. The examiner hereby withdraws the rejection of the claims over Kinsho in view of Harada. The applicants' argument in regard to Kinsho not teaching a substituted alkyl was convincing.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

12. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action.

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In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette C. Thornton whose telephone number is 703-305-0589. The examiner can normally be reached on Monday-Thursday 8-6:30.

14. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet C. Baxter can be reached on 703-308-2303. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

15. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1495.

yc


April 29, 2003



JANET BAXTER
SUPERVISORY PAPER EXAMINER
TECHNOLOGY CENTER 1700